Correlation coefficients and linear regression line equations for rats with ventromedial hypothalamic lesions and of their sham-operated controls

Treatment	n	Carcass component	$r \pm SEr$ [a]	$P_r <$ [b]	$y' = \frac{r SDy}{SDx}(x - \bar{x}) + \bar{y}$ [c]	$\pm SEE$ [h]
VMN	127	Fat % wet body wt.	$+0.73 \pm 0.041$	0.001	$y = 0.46(x - 329.9) + 26.5$	± 9.59
	127	Water % wet body wt.	-0.77 ± 0.036	0.001	$y = -0.39(x - 329.9) + 54.6$	± 7.16
	127	Lean body mass	-0.73 ± 0.041	0.001	$y = -0.12(x - 329.9) + 19.0$	± 2.52
CON	105	Fat % wet body wt.	-0.02 ± 0.098	n.s.	$y = -0.008(x - 304.3) + 9.4$	± 3.55
	105	Water % wet body wt.	$+0.29 \pm 0.090$	0.01	$y = 0.08(x - 304.3) + 66.9$	± 2.53
	105	Lean body mass	-0.11 ± 0.097	n.s.	$y = -0.02(x - 304.3) + 24.2$	± 1.79

[a] Coefficient of correlation $\pm$ standard error of r. [b] P value of r. [c] Predicted y = carcass fat, water and lean body mass, respectively. [e] Standard deviation of y/standard deviation of x. [f] Value of LEE Index minus mean of x. [g] Mean of y. [h] Standard error of estimate of linear regression line equation. 'Nutritive ratio' $= \frac{\sqrt[3]{\text{Body wt.}}}{\text{Naso-anal length (mm)}} \times 1000$.

related to the 'abnormal' type of obesity that has been described in weanling VMNL rats[13,7,15,21–23,16]. This metabolic type of obesity is characterized by increased plasma insulin and triglyceride levels, decreased pituitary and plasma GH levels and increased glucose-U-C^{14} oxidation, decreased palmitate-1-C^{14} oxidation, and increased incorporation of both glucose and palmitate into adipose tissue.

The data show that from simple body weight and length measurements, carcass fat, carcass water and lean body mass may be computed and predicted in rats with hypothalamic obesity. This is of value in the preliminary screening of VMNL rats prior to time-consuming histological verification of the lesions and before costly endocrine-metabolic analyses are performed.

Zusammenfassung. Verschiedene Untersuchungen im Zusammenhang mit Fettsucht wurden bei Ratten mit hypothalamischer Fettsucht, erzeugt durch Läsionen im Bereich des ventromedialen Teiles des Hypothalamus durchgeführt. Es konnten wertvolle Korrelationen zwischen Körperfett, Körperwasser und fettfreier Körpermasse errechnet werden.

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Sex Differences in Level of a Vasoactive Plasma Protein and Changes during Pregnancy

The isolated perfused vein of the rabbit ear constricts in response to human plasma and the activity of plasma is associated with a protein of mol. wt. 90,000–100,000. Similar activity is found in some Cohn fractions of human plasma protein, the most active of which is fraction III-O. Both plasma and venoconstrictor Cohn fractions cause hypotension when given i.v. and increased blood flow when given by intra-arterial injection in the dog and would thus appear to cause vasodilatation in vivo[1]. Fraction III-O provides a stable, reproducible standard preparation against which the venoconstrictor activity of various plasmas may be compared using the isolated perfused vein of the rabbit ear as the assay organ[2]. This paper reports the levels of venoconstrictor activity in the plasma of a group of ostensibly normal individuals of both sexes and compares the findings with those from a group of women in the second trimester of pregnancy – a situation in which there is vasodilatation and often a reduction in blood pressure below normal levels.

Blood was collected into heparin and plasma separated within 3 h. The plasma was stored at -20 °C for 24 h, then thawed and allowed to stand at room temperature for 1 h. This method was adopted as standard since it permitted the depletion of the kininogen of the plasma by activation of endogenous kallikrein and the destruction by kininase in plasma of the kinins thus formed. The venoconstrictor activity in plasma was estimated by 4-point assay using III-O solution as standard. Results were expressed in terms of units/ml, 1 unit being arbitrarily defined as the activity of 1 mg III-O standard. Since the concentration of protein in a sample can vary with the mode of collection of blood, with nutritional status of the donor and with other circumstances, activities have been expressed in terms of venoconstrictor activity per mg protein estimated by a quantitative biuret method[3].

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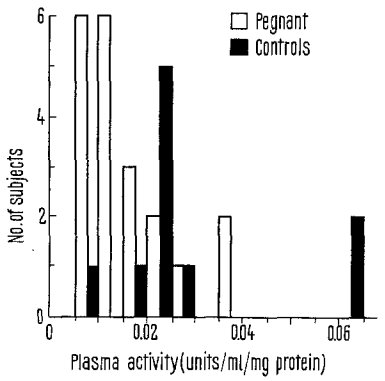

Fig. 1. Histogram showing levels of venoconstrictor activity in the plasma of 13 males and 10 females. Mean level for males, 0.015 (S.E. 0.0001) units/ml/mg protein was significantly lower than that for females, 0.029 (S.E. 0.0004) units/ml/mg protein, $p < 0.005$ by two tailed paired t-test.

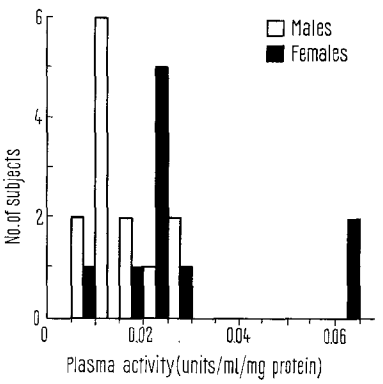

Fig. 2. Histogram showing levels of venoconstrictor activity in the plasma of 20 pregnant women and 10 non-pregnant women. The mean level for the pregnant women was 0.017 (S.E. 0.0001) units/ml/mg protein and was significantly lower than that for the controls, 0.029 (S.E. 0.0004) units/ml/mg protein, $p < 0.05$ by two tailed paired t-test.

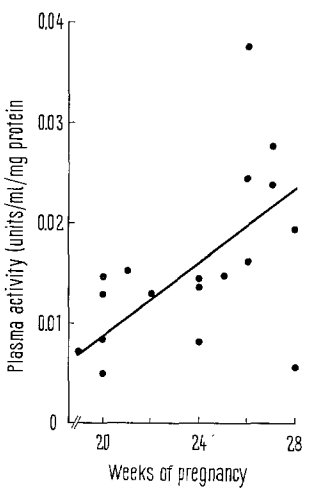

Fig. 3. Plasma venoconstrictor activity of 19 pregnant women plotted against weeks of pregnancy. Correlation coefficient = +0.68, $p < 0.01$. The regression line was calculated by the least-squares method.

Plasmas from 13 males and 10 females ranging in age from 12–64 years were examined (Figure 1). There was considerable overlap but the mean level in the males was significantly lower than in the females. No trend of level with age was apparent in either sex.

The higher levels found in women suggested that oestrogen may have been stimulating production of the vasoactive protein as is well known for many other specific proteins such as renin substrate or thyroxine- and cortisol-binding globulins. If this were so, an increase in concentration of the protein having vasodilator activity in vivo, caused by the high oestrogen levels of pregnancy could be involved in the vasodilatation and relative hypotension which is a feature of mid-term cyesis.

For these reasons, levels of venoconstrictor activity were estimated in 19 women at 19–28 weeks of gestation. The expected elevated levels were not found (Figure 2). In fact, there was a significantly lower mean level compared with non-pregnant women. The levels in pregnancy were similar to those found in men. It was not possible to follow the individual women through pregnancy but there seemed to be a higher level at 28 weeks than at 20 weeks (Figure 3). It was as though the levels were reduced at some time after conception to reach a nadir at or before the 20th week and then to rise progressively as the pregnancy continued. In 4 women bled 6 weeks post-partum, plasma venoconstrictor activity ranged from 0.031–0.087 units/ml/mg protein with a mean figure 0.052 (S.E. 0.014) units/ml/mg protein which suggests that there may have been an overshoot after the depression during pregnancy.

These unexpected findings give no support to the theory that changes in the level of this protein in pregnancy are responsible for its haemodynamic accompaniments. It is interesting nonetheless that this change occurs associated with a generalized vasodilatation due obviously to some other cause. This suggests the possibility that the levels are reduced by some homeostatic mechanism and thus implicates this protein in the matrix of balancing factors which result in normal vascular tone[4].

Zusammenfassung. Menschenplasma enthält ein Eiweiss, welches sämtliche Blutgefässe in vitro einengt, jedoch in vivo Arterienerweiterung zu veranlassen scheint. Das Plasmaniveau von Frauen ist höher als das von Männern. Während der Schwangerschaft fällt es ab und kehrt postpartum zu dem Ausgangspunkt der Kontrollen zurück, oder es steigt sogar über diesen Ausgangspunkt hinaus.

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